

COMMUNICATIONS

FRANCISCUS CORNELIS DONDERS

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ON November 6, 1958, a delightful ceremony took place at Utrecht to mark the centenary of the founding of the Eye Hospital in that city. The city and the government of the Netherlands, as well as a number of foreign ophthalmologists, combined with the university in celebrating the event which was honoured by the presence of Queen Juliana; and most fittingly the hospital entered the second century of its history as the Royal Eye Hospital of Utrecht, the first hospital of any kind in Holland to bear the "Royal" title.

The celebrations naturally centred largely in the personality of the founder of the hospital—Donders—at whose statue, standing in a quiet square in Utrecht, a wreath was laid in homage as the first event in a crowded day. And it was well conceived that a biography of the great Dutchman should be published,* for Donders was not only the father of Dutch ophthalmology but must be considered, together with von Graefe and Bowman, as one of the great figures who ushered in the new era of modern ophthalmology in the middle of the 19th century.

Donders was born on May 27, 1818, at Tilburg, a small manufacturing town in North Brabant, the youngest child and only boy in a family already comprising eight daughters. Immediately after his birth his father died of an apoplexy, brought on, it is said, by the unexpected fulfilment of a hope so long deferred. It is not surprising that in his early years, brought up in this female atmosphere, he was so spoiled and became so unruly that he had to be sent at the age of 7 to school at Duizel; here he earned pocket money by solving with rapidity and accuracy problems in arithmetic put to him by patrons of the local inn, and in general showed such precocity that he was made a paid tutor at the age of 11. Although he exhibited unusual proficiency in languages, arithmetic, and music, he decided to study medicine and for this purpose entered the University of Utrecht at the age of 17. On qualification he went to Flushing and then to the Hague as a military surgeon, and such was the impression he made upon the army authorities that, when the Military Medical School was formed at Utrecht, he was invited to be lecturer on Anatomy, Histology, and Physiology.

* "Franciscus Cornelis Donders." By F. P. Fischer and G. ten Doesschate, with a foreword by H. J. M. Weve. 1958. Pp. 223. van Gorcum and Comp., N.V. Assen.

Back in the University atmosphere, Donders at once threw all his energies into its scientific life, publishing a number of original papers. Two of them were of outstanding merit. In one, published in 1844 when he was only 26 years of age, he claimed that the principle of conservation of energy applied to life processes; animal heat is chemical heat, and in the economy of living organisms "there is a sum of energy as there is a sum of matter". In the second, published in 1846, followed by another on the harmony of animal life (1847), he contested the almost universally accepted doctrine that species were created each by a separate and independent act and claimed that all forms of life were moulded into their separate forms by the continuous operation of natural laws operating throughout the ages. It is not surprising that when Darwin's *Origin of Species* appeared in 1859, Donders was one of the most ardent supporters of the great English naturalist.

Such was the reputation that he derived from these scientific contributions that in 1847 the University of Utrecht did an unusual thing. Wishing to secure his services and having no vacant chair, they invited him to become a professor extraordinary, asking him to select his own subjects for lecturing. He chose Forensic Medicine, Anthropology, General Biology, and Ophthalmology. The last was a significant but accidental addition, for it is too often forgotten that Donders was essentially a biologist and physiologist. At that time, however, he was in financial difficulties, for he now had a wife and child, and to augment his income he had undertaken the translation of Ruete's great German treatise on ophthalmology. In this subject his interest at that time was, of course, essentially physiological—the physiology of vision and the refraction and accommodation of the eye. Then a second fortunate chance arose, which was to have a great influence on his future life. Coming to London in 1851 to see the first Great Exhibition, he met von Graefe and Bowman, and here he learned of the exciting event of the introduction of the ophthalmoscope by von Helmholtz. He seemed to be greatly attracted to these two great scientific clinicians; the new ideas they discussed fascinated him and it appeared obvious that ophthalmology could offer opportunities for the practical application of scientific methods more adequately than any other branch of medicine. As a result, on his return to Utrecht, he started ophthalmic practice; his fellow citizens provided him with a temporary hospital and some years later subscribed 40,000 florins for the construction of a permanent institution containing forty beds, an institution which was to be not only a clinical hospital but also a centre of research associated with the university. That this unique opportunity was made available to him at that time was fortunate for Utrecht, for on this account Donders refused the invitation of the University of Bonn to succeed von Helmholtz as professor of physiology—an offer which tempted him much.

But, although in our minds Donders is usually considered primarily as an ophthalmologist, his interests were essentially physiological and his ophthalmological life was short. It is true that in 1858, about the time his

hospital was opened, there appeared the first of a long series of classical papers on the anomalies of accommodation and refraction of the eye which were to appear during the subsequent six years, so that in 1864 the volume published by the Sydenham Society of London contained a new and complete doctrine on the theory and practice of the correction of optical anomalies by spectacle lenses. But in 1862 the chair of physiology fell vacant at Utrecht and he was pressed to accept it, while at the same time a new physiological laboratory was built for him. On his assumption of this new post his pupil Snellen followed him at the Eye Hospital. In physiology he laboured, as always, with incessant zeal and his researches covered a wide field; his productivity was enormous, and on each subject which he studied he left an indelible mark—the physiology of speech, the speed of nervous reactions, muscular contractions, the movements of the heart, the chemistry of respiration, colour vision and colour blindness, and a host of other problems.

Donders was now occupying a position almost unique in science and medicine, while his unusually delightful personality and his simple earnestness, his exceptionally wide knowledge and command of languages, his dignified bearing and his gifts as a speaker, made him outstanding in scientific meetings. He was president of two International Congresses of Ophthalmology—a unique distinction—both of them held outside Holland: the Fourth Congress held in London in 1872, and the Seventh held in Heidelberg in 1888. He was president of the Sixth International Medical Congress held in Amsterdam in 1879, and vice-president and royal medallist of the Seventh International Medical Congress held in London in 1881. He was President of the Royal Netherlands Academy of Sciences and a foreign member of the Royal Society of London.

In 1888, having reached the age of 70, Donders retired from his professional chair to be succeeded by his brilliant and eminent assistant and son-in-law, Engelmann. On May 27 and 28 in that year, his university, his country, and scientific men from all over the world combined to do him honour. The students even altered the sacred words of the *Gaudeamus*:

Vivat Academia!
Vivat noster Donders!
Lex te jubet "decedas",
Nos invitus salutas
Nondum moriturus.

He was decorated by the King of the Netherlands and a medal was struck in his honour. At the celebrations practically every university of the civilized world was represented; the Physiological and Ophthalmological Societies in Great Britain sent deputations, and the Royal Society was represented by Joseph Lister, Jonathan Hutchinson, and Hughlings Jackson. Typically, the large sum subscribed and presented to him was assigned by him to the universities of the Netherlands for the establishment of travelling fellowships in physiology and ophthalmology.

Loved and honoured by his contemporaries as few men ever had been, holding a unique and respected position among his fellow citizens and fellow countrymen, and happy in the design of a new scheme of research on the origins of art in man, as exemplified particularly in the life and work of Leonardo da Vinci, a long and happy evening seemed to be promised to his life. But while on a social visit to England in the autumn of 1888, he had a cerebral seizure, from which he recovered sufficiently to return home to die, suddenly like his father, on March 14, 1889. Less than a year after its two days of rejoicing, Utrecht went into mourning; but to-day, not only Utrecht but the whole world of ophthalmology rejoices in his memory.